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AUTHOR Laferriere, Therese; Breuleux, Alain; Bracewell, Robert
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ABSTRACT

This paper points to the teacher professional development practices in a networked classroom that become reality with the use of advanced telecollaboration tools such as Virtual-U and KnowledgeForum. Those tools support, extend, and strengthen the establishment of teacher learning communities and their collaborative inquiries. Those inquires are part of larger design experiments aiming at studying teacher learning when deep understanding is the goal of the knowledge-building activities that pre-service, in-service, and teacher education educators engage in. The objectives of the paper are: to described the online information and communication practices of teacher learning communities that are emerging at two of the TL-NCE (TeleLearning Network of Centres of Excellence) sites at McGill University (Quebec) and Laval University (Quebec); and to point to the early converging results of collaborative inquiries that have been carried out into both Anglophone and Francophone networked classrooms. The practices at the TL-NCE sites illustrate the transformative processes underway in teacher education when collaborative use of information and communication technology is made in networked classrooms. Contains 24 references. (MES)

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Collaborative Inquiries into the Networked Classroom

TeleLearning Network of Centres of Excellence
Thérèse Laferrière
Laval University
tlaf@fse.ulaval

Alain Breuleux
McGill University
Breuleux@Education.McGill.ca

Robert Bracewell
McGill University
ed18@musica.mcgill.ca

G.H. Marks

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Abstract: This paper points to the teacher professional development practices in a networked classroom that become reality with the use of advanced telecollaboration tools such as Virtual-U and KnowledgeForum. Those tools support, extend, and strengthen the establishment of teacher learning communities and their collaborative inquiries. Those inquiries are part of larger design experiments aiming at studying teacher learning when deep understanding is the goal of the knowledge-building activities that pre-service, in-service, and teacher educators engage in. The practices at two of the TL-NCE sites illustrate the transformative processes underway in teacher education when collaborative use of information and communication technology is made in networked classrooms.

Introduction

The practice of Internet-based activities is transforming teaching and learning in the classroom as well as it is transforming learning to teach. Interactive learning materials and activities are being developed, and computer-mediated communication tools support the classroom conversation beyond usual limits. Educators of educators are faced with a new challenge, one which is at once risky and compelling given the window of opportunity that is now opened: at the one end of the spectrum, network-based learning is viewed as a means to increase choice (modules and courses) and, sometimes, academic results or performance, and at the other end, as the essential activity for maintaining our scholastic cultures through knowledge-building communities. And then again, teachers are engaged in learning about the technology even as they are to help their students work with it.

Teacher educators involved in the TeleLearning Network of Centres of Excellence (TL-NCE) share the belief that educators must have a say in the orientation and the conduct of emerging on-line learning and teaching practices. The TeleLearning research program, funded under Canada's National Centres of Excellence, contains an important teacher education component that seeks to develop a model of integrating technology into teacher education. The model identifies a) under what conditions teachers can become thoughtful and reflective utilizers of educational technologies that support, extend, and strengthen their work as educators, b) how those conditions are achieved in a variety of situations and c) the consequences of such achievements. The research program is aimed at assisting pre-service and in-service teachers as well as teacher educators while gaining knowledge and skills of a practical or intellectual nature which they are called upon to master, in order to accomplish the tasks and functions expected of them now or in the not too distant future.

The objectives of this paper are 1) to describe the on-line information and communication practices of teacher learning communities that are emerging at two of the TL-NCE sites, and 2) to point to the early converging results of collaborative inquiries that have been carried out into both Anglophone and Francophone networked classrooms.

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The changing parameters of learning

There is ample evidence that important determinants of learning are time-on-task and active learning strategies (Ewell & Jones, 1996). Cooperative and collaborative learning strategies engage students in constructive, reacculturative conversations with one another, helping them achieve better academic grades (Springer, Stanne, and Donovan, 1999). Computer-mediated communication research (Fjermedal, 1986; Cooper & Selfy, 1990; Hiltz, 1992; Harasim, 1993; Lévy, 1994) points to the potentials of on-line communication for collaborative and emancipative learning. What is learned is not only about what students read but what is said to one another about what they read (Pence, 1993).

However, the most adequate ways of educating educators not for instruction per se, but for every student to learn by whatever means work best are not always applicable on campus. The lecture-discussion classroom format remains, including in schools of Education, the primary means of producing instruction in North American colleges and universities today because it does in fact produce a lower cost of instruction than the use of individualized active and or collaborative learning strategies. Schools of Education are criticized by preservice and inservice teachers for their lack of coherence between what they espoused theoretically, and what they practice on campus.

Many schools of Education in North America have redesigned their curricula over the last decade, most especially their practice curricula (the Professional Development School Model), to be amenable to research on learning and teacher education research. Many teacher educators have adopted the constructivist view of learning. But campus-based learning coupled with field experience in school setting continues to be the primary mode in professional teacher education. Changes in educational paradigms and the evolving nature of an ever growing information society, create new opportunities and challenges for educators in all sectors and at all levels. And the emergence of networked communities of learners is leading the way toward the development of viable alternative educational models.

The emerging practice of computer-supported collaborative inquiry

On-line resources and tools are usually understood to mean the information and communications technology (ICT) applied to teaching and learning for the purpose of providing: 1) the flexible delivery of educational material (technology for the instructor), 2) the guidance and facilitation of the experience of the student (technology for the learner), and 3) the support of communities of learners (collaborative learning). Thoughtful and effective use of on-line resources and tools is understood to encompass those pedagogies that take advantage of "applications that engage students with the material, illustrate complex systems or relationships, and encourage interaction with other individuals or teams. Ultimately, the technology tools should become transparent as they integrate the user in the process, enabling immersion in the learning level, and that, on an individual or community basis." (NSF, 1998, p. V)

The virtual community of communication and support for teachers working in networked classrooms, established in Phase I of the research program (TL-NCE), is now moving toward curriculum-oriented collaborative knowledge building activities. Participants are encouraged to co-construct their knowledge of thoughtful and effective use of online resources and tools in a networked classroom. Collaborative inquiry is central to the knowledge-building process, and participants are enabling one another as they seek to understand how information and communication technologies can best support student learning. One strand of collaborative inquiries is dealing with the contribution of new information technologies to learning and teaching in elementary, secondary, and post-secondary classrooms, and involves school teachers, university researchers and graduate students from McGill University (Montreal, Canada) and Laval University (Quebec, Canada). The "community of practice" model is applied (Lave & Wenger 1991), and participants share a common set of purposes, practices, and perspectives. The networked classroom generate a whole new set of problems for novice as well as for expert teachers. Collaborative inquiries on specific questions, issues and challenges are conducted, for instance, in VGroups (a key component of the Virtual-U platform) at local sites or between sites. Access to and appropriation of valid and relevant knowledge for teaching in the networked classroom somewhat depend on their success to learn with one another. Key themes being discussed are the following ones: 1) learning and teaching for understanding, 2) cooperative learning and telecollaboration tools, 3) collaborative learning activities and projects using online resources and tools, and 4) the changing role of the teacher and of the learner. Novice teachers and expert teachers co-construct valid understandings of the thoughtful and effective use of on-line

resources and tools in face-to-face and on-line discussions. As they negotiate the meaning of their emerging practices, they develop identity relationships that enable them to increasingly think of themselves as true members of interconnected communities of learners (teachers-as-learners). This strand of collaborative inquiry has led to documentary reviews (1996, 1998, 1999) that condense for practitioners and policy makers articles, reports, papers and book chapters addressing the question of the contribution of ICT to learning and teaching (see Bracewell, Laferrière, Breuleux, Benoit, and Abdous, 1998). Some of the trends identified are the following ones: 1) the emergence of a mixed mode of learning: face-to-face and on-line learning activities; 2) the unresolved debate over the nature of information access as being or not more direct, interactive, and flexible; 3) the renewed interest in classroom social interaction.

Another strand of collaborative inquiries focuses on the nature of the activities and processes that on-line discussion forums (or dynamic databases) may support when it comes to teacher professional development. Pre-service, in-service teachers, and teacher educators are involved, at times jointly, at times in distinct forums. Depending on the circumstances, pre-service teachers may engage in either collaborative journal writing, collaborative inquiry projects or other forms of knowledge-building activities using Virtual-U VGroups, eGroups, or FirstClass. The V-Groups are, for instance, supporting pre-service teachers' collaborative journal writing, an activity commonly known for its private nature: a conversation occurring between the student teacher and the university supervisor, one sometimes inclusive of the school cooperative teacher. What a student teacher is interested in and what he or she is willing to share becomes visible to all other student teachers and, at times, to those of another cohort (same-year cohort or next-year cohort). Those discussion forums provide views into learning and teaching for those engaging in early field experiences, or preparing for their student teaching. Permissions are granted on a reciprocity basis. Some messages may be deleted in order to respect confidentiality. The platform used becomes an on-line collaborative space, that is, a place for teacher knowledge exchange. It is an evolving space, as incoming student teachers not only benefit from previous online discussions, but add to the content of what is being shared. Reflective teaching activities such as problem setting and problem solving are found to be enhanced, and Laval University student teachers are nearly unanimous in recognizing the value of using a telecollaboration tool such as Virtual-U VGroups to these ends (Legault, in press). As they graduate, they keep their identification code and password to this virtual community.

In-service teachers who use telecollaboration tools such as VGroups, eGroups or Knowledge Forum to gain, or advance, their understanding of effective use of on-line resources and tools, make transparent their engagement in on-line practice for themselves and for the school learners they work with. They deal with dilemmas and problems, create artefacts (templates for use in the classroom, links with the curriculum through concept maps, lists of suitable websites, on-line problem-solving activities, etc.), and share ways of doing things, and creative products. They are inclined to create their own school or personal webpage. Given the opportunity, they link those to a message in a discussion forum (VGroup or eGroup). Many-to-many communication for collaborative inquiry purposes are found to be an advanced use of information and communication technologies. A few inquiries of that sort have been conducted using WebKnowledge Forum, and most resulted in educational materials being created for classroom use (dynamic databases). Some of those inquiries involved only teachers, and others elementary or secondary school learners.

The above findings are part of larger design experiments. At the Laval University / Quebec City Site, the attempt is to enable a large network of associated schools to make adequate use of ICT through the building of a capacity for collaborative teacher learning and teaching in the networked classroom. It is in this context that discussion forums and dynamic databases are emphasized. This is to say that face-to-face and on-line activities are being combined. The collaborative on-line places are analyzed on an ongoing basis in order to identify recurring and evolving thematic content and patterns of communication. At the McGill Network of Professional Development Schools (PDSs), researchers are attentive to the socio-cognitive discourse that is being displayed in on-line conversations (see Breuleux, Bracewell, and Renaud, 1995). Their focus is on the different sources of knowledge required of participants to engage in successful knowledge-building communities. What knowledge results from participation in networked communities of learners remains the central question under investigation in the research project as a whole. Educators in the McGill TL•PDS Net are developing a practical understanding of on-line discussion and information tools. For example, 70 student-teachers and practicing teachers in the McGill TL•PDS Net have used actively the web-based eGroup environment during, and following, the 1999 Summer Institute: they have exchanged close to 500 messages starting in August and up to November 1999 . The messages served a variety of purposes such as information sharing, interpersonal support, team building, and knowledge

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building. These educators also are learning in practical and experiential ways how on-line knowledge-building communities are formed, and what purposes can be achieved by such communities. For example, teachers in three schools of the McGill TL•PDS Net have formed, and are monitoring, their own on-line groups for students and/or colleagues. Therefore, there is an emerging practice of on-line collaboration that extends learning in powerful ways, but most importantly there is a growing ownership of the tools, with an associated sense of efficacy on the part of the teachers.

Early converging results

As elementary, secondary, and university classrooms get networked, teachers are grasping the potentials of telecollaboration tools. The many-to-many communication patterns enable by tools such as VGroups and KnowledgeForum are seen as ways to enrich, extend, expand, and deepen the conversation in the classroom, be it at the elementary, secondary, or post-secondary level. However, in order for those tools to lead to successful collaborative inquiries in the networked classroom, a reframing of one's understanding of what learning and teaching are all about is often found to be necessary. The implications of the socio-constructivist perspective on learning requires not only a shift of thinking, but in doing as well. Tools that catalyze, support and enable such a change are found to be necessary.

After experiencing an initial shock when being presented with the possibility of using VGroups (Virtual-U), Laval pre-service teachers use of this tool confirms their interest in collaborative learning and teaching. As demonstrated by their readings of the writings of more advance pre-service teachers, they manifest openness and respect for, and recognize the relevance of the writings of more advanced pre-service teachers that have gained expertise in the use of online resources and tools. Their trust in the value of such materials is key to the development of a collaborative knowledge-building capacity in the whole Quebec City Region since 80% of the graduates are likely to teach in that area. They also manifest a positive attitude in looking into in-service teachers collaboratively built data bases (Web Knowledge Forum). However, only a few demonstrate confidence in their capacity to successfully use that tool in their own upcoming classrooms.

The design of the McGill Institute confirms that developing a thoughtful and reflective practice of educational technologies that supports learning can be achieved under conditions that include the following: a) a willingness and a capacity on the part of the practicing teacher to mentor student-teachers, and in doing so to open her practice as a model for inspection by someone else (an essential capacity to be reflective). This capacity is found to be a pre-requisite for successful on-line discussions to include substantial discourse about practice and about its development; b) a school climate that supports (or is conducive to) collaborative knowledge building among the teaching staff; c) guided discovery activities for teachers allowing them to develop technology practices and tools that have two attributes: they are connected to the practice as it currently exist, or to the practice that is aimed by the group, and allow connections between the two practices.

The consequences of an emerging, thoughtful, and reflective practice of educational technologies that support and extend learning include the establishment of new relationships between the members of the teaching staff within a school, the establishment of relations between teachers in different locations, and increased connections between student teachers and teachers.

This design experiment is now entering a phase where issues of leadership are crucial. We are examining leadership practices that support the participation of teachers in on-line learning communities, how leaders can develop their own learning communities, and how teachers can become leaders in their school or school board about the use of ICT to support advanced pedagogies such as collaborative knowledge-building.

Forms of support and communication among the participants may vary while learning takes place in learning networks pertaining to teacher professional development. The different range of learning outcomes entailed in teaching and working with these new technologies, is found to be highly dependent of the level of access to online resources and tools, the support of the local context, the nature of the curriculum, and the teacher's pedagogy. Those process-related converging findings are found to support the cohabitation of educators at different levels of technology practice, and to promote collaboration in design, implementation, and inquiry.

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